

## Author Response to Editor Comments

# Soil moisture observation in a forested headwater catchment: combining a dense cosmic-ray neutron sensor network with roving and hydrogravimetry at the TERENO site Wüstebach

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**RC: Reviewer Comment,**    AR: Author Response,     Manuscript text

Dear Sibylle,

thank you for your feedback on the revised version of our manuscript, and for giving us the opportunity to address the issue of data uncertainty. Herewith, we would like to submit a revised version of the manuscript, and respond to your comments.

We agree that this issue is important, and, as you noted, already addressed in some parts of the manuscript (e.g. for the hydrogravimetry and lysimeter data). Following your suggestion, we added, where missing in section 3, brief statements on measurement uncertainties as well as on sources of uncertainties that govern soil moisture estimation. To that end, we mostly refer to previous publications in order to avoid inflating the manuscript unnecessarily.

However, we would like to emphasize that, beyond the uncertainty of the actual measurements, the uncertainty of soil moisture estimated from such measurements will be highly heterogeneous and elude any general statement; it will depend on the processing methods, on the target scale, and on the way different sensors are combined. For some of the data subsets, we are just starting to *understand* what governs the uncertainty of soil moisture estimates (e.g. for airborne roving). It is one of the motivations of this data paper to enable research on the quantification of uncertainties across sensors and scales, but it is obviously beyond its scope to comprehensively address the theoretical and technical dimensions of such an endeavour (and we also confident that this is not what you had in mind).

Given this lengthy "disclaimer", we tried to revise the manuscript along the spirit of your comment, and hope that the revised manuscript can now be considered for publication.

Kind regards,

Maik (on behalf of the author team)